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INTER-COMPANY CORRESPONDENCE

(INSERT
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COMPANY CARBIDE AND CARBON CHEMICALS COMPANY

LOCATION

Post Office Box P
OAK RIDGE, TENN.

TO Mr. J. A. Marshall
LOCATION K-303-7

DATE January 20, 1956

ANSWERING LETTER DATE

ATTENTION

COPY TO Mr. A. L. Allen
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Mr. M. F. Schwenn
Mr. H. G. P. Snyder
Mr. E. O. Sternberg
Mr. B. H. Thompson

SUBJECT Contaminated Waste Disposal
KSA-23

PRD-1

K25RC

Special hazards consideration has been given to the collection of miscellaneous waste materials, which are contaminated with enriched uranium, and their subsequent disposal by burning in 2 gas-fired incinerators¹ which are located in a separate building adjacent to K-1420; these units will replace the existing unit at K-1410.

Equipment and Operation (Nash, Cadmus, and Voelker Drawings No. 1-F-225, 1-F-226, 2-P-598, and Green Fuel Economizer Drawing No. 20-5953-A)

In general, contaminated burnable materials from which visible uranium has been removed insofar as possible are collected in waste containers, which are identified in accord with plant procedures,^{2,3} and transferred to the K-1420 waste disposal unit. It may be noted that, of these materials, contaminated oily rags are collected only in 5" I.D. containers.

At the waste disposal unit, burnable material is segregated into 2 groups, one with a maximum possible U-235 assay exposure of less than 2% and the other of above 2%. The waste is then reinspected for visible uranium material prior to furnacing and any such material noted is removed with a safe vacuum cleaner; the oily rags are first decontaminated with freon or trichloroethylene in geometrically safe equipment. Ash obtained from material above 2% assay is collected in 5" I.D. x 2' containers, while the lower assay material is collected in 30-gallon drums. In any event, the ash is removed from both

- 1 Letter to H. F. Henry from J. Dykstra, K-1420 Incinerator, 5-9-55
- 2 Standard Practice Procedure, Labeling of Radioactive Contaminants and Penetrating Radiation Hazards, No. 315, Revised 11-22-55
- 3 Letter to supervision concerned from B. H. Thompson, Contaminated Burnable Material, 10-24-55

RESTRICTED DATA

This document has been approved for release to the public by:

John F. Rosta 7/25/96
Special Information Officer
Oak Ridge K-25 Site

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Carbide and Carbon Chemicals

Company, Operating Contractor for
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ash pits to appropriate containers at least twice each shift, and the stack dust collector system, which serves both incinerator units, is inspected weekly for ash accumulation; any such material noted is removed with a safe vacuum cleaner. The ash, vacuum cleanings, and contaminated freon and trichloroethylene are transferred to the K-1420 storage area⁴ or to Coded Chemicals.

Special Hazards

The procedures in effect as outlined above appear adequate to prevent an unsafe accumulation of uranium in the waste prior to burning; thus, the principal problem of concern is the handling of the contaminated ash since more efficient combustion in the new unit may result in a higher uranium concentration in the ash.

Since the ash will be removed from each incinerator ash pit at least twice per shift, it is considered unlikely that an unsafe accumulation will occur in these units. Similarly, the weekly inspection of the stack dust collector components and the subsequent removal with a safe vacuum cleaner of any accumulation noted is considered sufficient to prevent an unsafe accumulation in these units; any such material in itself is light and should be relatively free of uranium.

The use of 5" I.D. containers for accumulations of ash where the uranium will have a U-235 assay above 2% presents no problem. The 30-gallon drums used for the collection of ash material below 2% U-235 assay are not geometrically safe, and previous experience has shown that a maximum of 325 lb. of ash can be placed in such a drum; it may be noted that the uranium resulting from furnacing will probably be in the form of U_3O_8 for which the safe amount is 260 lb. at 2% assay. However, the following safety factors in the actual accumulation of ash are considered adequate to prevent a chain reaction:

1. The ash is not all U_3O_8 . In fact, experience has shown that several drums of ash are necessary in order to accumulate 260 lb. of U_3O_8 .
2. The safety factor on the safe quantity of 260 lb. of U_3O_8 is such that the minimum critical amount is much greater than 325 lb.
3. The resultant U-235 assay will probably be much below the maximum of 2% since large quantities of normal assay waste are burned.
4. Optimum conditions of moderation are not anticipated.

⁴ Henry, H. F., K-1420 Storage Area, 11-4-55, (KSA-4)

The allowable interaction effect will not be exceeded provided a spacing of 8' is maintained between the 30-gallon ash drums and a 4' spacing is maintained between the 5" I.D. containers of ash, oily rags, or contaminated freon and trichloroethylene; only one ash container will be in transit at a time. Since it is unlikely that the incoming waste, with the exception of the oily rags, will contain more than a negligible quantity of enriched uranium, there appears to be no problem of spacing such containers in transit or in the temporary storage at K-1420.

Conclusion

The collection of contaminated waste materials and their disposal by burning in the K-1420 incinerator units appears safe provided the precautions as specified above are in effect.

Hugh F. Henry

H. F. Henry

Safety, Fire, and Radiation Control

W. A. Pryor:AJM:vr